Math 157 - Quiz 1

Name Key

August 21, 2013

Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (2 points) Find a value for x so that the distance between the points $(2, -1)$ and $(x, 2)$ is 5. Then find the midpoint of the segment joining your points.

$5 = \sqrt{(x-2)^2 + (2+1)^2}$

$25 = (x-2)^2 + 9$

$16 = (x-2)^2 \Rightarrow x-2 = \pm 4$

$x = 6$ or $x = -2$

Using $x = 6$, the points are $(2,-1)$ and $(6,2)$

Midpoint is $\left(\frac{6+2}{2}, \frac{2+(-1)}{2}\right)$

$= \left(4, \frac{1}{2}\right)$

2. (2 points) When Joe worked 8 hours, he made \$92. When he worked 10 hours, he made \$120. Find a good estimate for the amount of money Joe will make if he works 9 hours.

A good estimate comes from the mean/midpoint

$\frac{92+120}{2} = \frac{212}{2} = 106 \Rightarrow \$106$

3. (2 points) Find the x- and y-intercepts of the graph of $y = x^2 + 5x - 14$.

y-int: $x = 0 \Rightarrow y = (0)^2 + 5(0) - 14 = -14$ $\quad (0, -14)$

x-int: $y = 0 \Rightarrow 0 = x^2 + 5x - 14$

$= (x+7)(x-2)$

$\Rightarrow x = -7$ or $x = 2$

$(2,0)$ and $(-7,0)$

4. (2 points) Find the break-even point if the cost and revenue equations are $C = 130x + 12600$ and $R = 200x$, respectively.

BREAK EVEN WHEN $C = R$

$130x + 12600 = 200x$

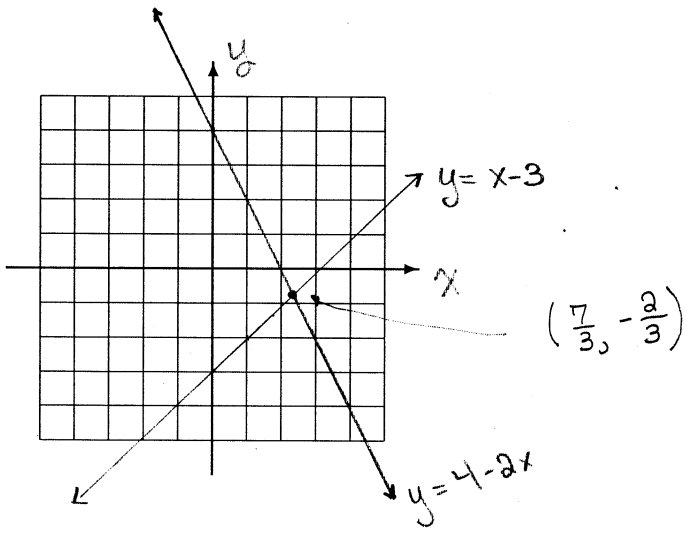
$12600 = 70x$

$\frac{12600}{70} = x \Rightarrow x = 180$

$x = 180$

$C = R = \$36{,}000$

5. (2 points) Sketch the graphs of $y = x - 3$ and $y = 4 - 2x$. Then find the point of intersection.



$y = x - 3$

Slope $m = 1$

Y-INT $(0, -3)$

$y = 4 - 2x$

Slope $m = -2$

Y-INT $(0, 4)$

POINT OF INTERSECTION

$x - 3 = 4 - 2x$

$3x = 7$

$x = 7/3$

$y = 7/3 - 3 = -\frac{2}{3}$

$\left(\frac{7}{3}, -\frac{2}{3}\right)$